"These two sets of elements do not present any remarkable difference; nevertheless, the correction of the first has sensibly diminished the differences between the calculated and observed places. In the second approximation the greatest errors in the distances belong to 1835 and 1838; the last is almost 0″·2. It is evident, on comparing the neighbouring observations, that the greatest share in these errors belongs to the observations themselves. The other distances are well represented. As to the angles of position, there are only four which vary from 0″·10 to 0″·13, and here the fault may be imputed chiefly to the observations. Taking a mean of the variations which exist with the corrected elements, I find 0″·046 both for angles of position and for distances. This result shews how advantageously the distances of M. M. Struve may be employed.*

"M. Struve estimates the probable error of a mean of three measures, when the distances are nearly those of the preceding table, to be 0″·05 for distances, and 0″·03 for angles of position. The mean error assigned above is rather less than M. Struve's for distances, and half as large again for angles of position. The agreement in the angles of position for this star is not quite so satisfactory as that which I found in my researches on *η Coronæ*. The differences in the second approximation shew permanences of sign which cannot be made to disappear by correcting the elliptic elements. As to the cause, it cannot be searched for here, in perturbing actions or in aberrations, since the observations are barely sufficient to determine the constants of elliptic motion."†

Note upon the Mass of the Planet Neptune, as deduced from Observations of his Satellite. By Mr. Hind.

"The satellite of *Neptune* has been frequently observed at Starfield by Mr. Lassell; at Cambridge, United States, by Professor Bond; and at Pulkova by M. Otto Struve. There are about forty complete observations of position and distance up to the end of October 1848.

"By supposing the inclination of the orbit of the satellite to the ecliptic = 30° and the place of the node in 300°, and by assuming

* I have not compared the distances observed by other astronomers, as they are not in sufficient numbers to give the value of the semi-axis major which corresponds to each observer.

† Calculated elliptic elements cannot be made to satisfy a series of distances, unless the distances are absolutely correct; a constant error, such as has been suspected from the varying results of different observers, will spoil the coincidence. It is much to be wished that observers who possess instruments of sufficient power would carefully and repeatedly measure the distances of *ξ Ursæ Majoris*, *η Coronæ*, &c., in order that something definite may be known of the extent and constancy of these personal or instrumental equations. Possibly the true measure might be approximated to, by assuming a correction for each observer, such as would make the elliptic elements, deduced from angles of position, agree best with his observed distances.

that a nodal passage occurred on 1847, Oct. $2^{d}\cdot745$, Greenwich Mean Time, and that the period (as indicated by the whole series of observations) is $5^{d}\cdot8750$, the angles of position observed by Mr. Lassell and Professor Bond are well represented; but the measures of M. Otto Struve present a marked disagreement in angle, the mean error of calculation, according to eleven observations by this astronomer, being $+6^{\circ}\cdot6$: the individual errors are uniformly in excess. I can discover no mistake in my computations, and can only suppose that we have here another instance of a constant personal equation affecting the measured angles of position, similar to that which has been pointed out by Sir John Herschel in Professor Struve's observations of γ *Virginis*, and in Professor Mädler's more recent measures of the same star.

"The distances present a similar anomaly. Treating the observations at the three observatories separately, I find,—

The Apparent Mean Distance of Satellite from Planet's centre,

At Distance = 30·0,	by Professor Bond's observations	16″·102
—— —	by Mr. Lassell's observations	16·423
—— —	by M. Otto Struve's observations	18·060

"The values inferred from the English and American measures agree as nearly as can be expected from the number of observations employed. The Pulkova distance is nearly two seconds greater than this mean, a quantity sufficient to produce a very material alteration in the mass of the planet as determined by observations of the satellite.

"The cause of these differences may, perhaps, be explained hereafter; but the knowledge that such constant discordances may exist between different observers will probably tend to throw much uncertainty over the values of the planet's mass deduced from actual observation.

"If we assign to each of the above results its proper weight depending on the number of measures on which it is founded, we shall have for the radius of the satellite's orbit at the same unit of distance,

$$16''\cdot748,$$

and supposing the periodic time $5^{d}\cdot8750$, which must be close upon the truth, the mass of *Neptune* comes out

$$\frac{1}{17900\cdot}$$

"The distance of the satellite from the planet's centre appears to be 232·000 miles."

On the first Comet of Brorsen, 1846. By Mr. Hind.

"In the *Monthly Notice* of this Society for November 1846, I pointed out the remarkably close approach of the periodical comet